

### **REMARKS**

Claims 9-16 and 48-63, as amended, as well as new claims 64-66, are currently pending for the Examiner's review and consideration. Claims 15, 16, and 63 have been amended to clarify the claim language similarly to that recited in claim 62, to correct typographical errors, and to more clearly describe the invention to be claimed therein. Claim 9 has been amended to recite that the pH range is from 6 to 9, while new claims 64-66 depend from claims 9 or 10 and recite pH ranges of 6-9 or 7-9, respectively. Support for this amendment and these new claims can be found in the originally-filed specification, *e.g.*, at Example 4, page 58, line 18 and page 58, line 27 through page 59, line 3. As no new matter has been added by these amendments or the following remarks, Applicants respectfully request entry of these amendments and remarks into the record of the above-captioned application.

Initially, Applicant notes that page 2 of the Office Action indicates that claims 13 and 48-57 should be withdrawn as being directed to a non-elected invention. However, Applicant respectfully points out that the prior Election of Group C (malonic acid), in response to the previously imposed Restriction Requirement, was contingent upon no generic claim being allowable. In the prior Office Action imposing the Restriction Requirement, mailed November 19, 2003, the Examiner acknowledged on page 2 that claims 9, 11-12, and 14-16 were generic. Applicant respectfully notes that claims 13 and 48-57 can be reintroduced if there is a determination that a generic claim is ultimately allowable.

### **The Rejections Under 35 U.S.C. § 103(a) Should be Reconsidered and Withdrawn**

Claims 9-12, 14-16, 58-60, and 62-63 were rejected under 35 U.S.C. § 103(a), as being obvious over the combination of U.S. Patent Nos. 5,993,686 to Streinz *et al.* ("Streinz") and 5,858,813 to Scherber *et al.* ("Scherber") on pages 2-4 of the Office Action. The Office Action indicated that Streinz allegedly teaches a method of polishing tungsten and a dielectric material using a polishing composition comprising periodic acid and malonic acid in the claimed ranges, as well as a pH adjusting compound and an overlapping pH range with the claimed pH. However, Applicant respectfully traverses

and respectfully submits that Streinz, alone or in combination with Scherber, does not teach the invention as currently claimed.

Streinz teaches a CMP slurry comprising an abrasive, an oxidizing agent, and a fluoride containing additive. *See* Streinz at column 3, lines 21-23. Streinz also teaches the potential inclusion of a wide variety of optional additives, including inorganic acids/salts, organic acids/salts, surfactants, polymeric stabilizers, and other surface active dispersing agents. *See Id.*, column 7, line 17 through column 8, line 14. Indeed, regarding the optional organic acid component alone, Streinz suggests 26 separate compounds, plus “derivatives, including salts thereof,” the extent of which is not explicitly defined for such acids but is most definitely a large number (for instance, in other places in the specification, many varieties of salts and classes of salts are enumerated, *e.g.*, columns 3-4 for oxidizers). In addition, Streinz teaches a composition pH up to about 5.0, above which point “tungsten corrosion problems can occur.” *See Id.*, column 5, lines 30-32.

Streinz does not disclose or suggest a pH from 6 to 9, as recited in independent claim 9, as amended, as well as in new dependent claim 65. Indeed, Streinz teaches away from pH values above 5.0 due to tungsten corrosion problems in CMP compositions having such a pH:

“It is desirable to maintain the pH of the CMP slurry at between 1.3 to about 5.0 because tungsten corrosion problems can occur at a slurry pH above about 5.0. When the oxidizing agent used is ferric nitrate it is preferred to maintain the pH of the chemical mechanical polishing slurry in a range from about 1.5 to about 3.0. Regardless of the oxidizing agent chosen, it is preferable to maintain the pH of the polishing slurry below about 5.0 in order to prevent etching and corrosion of tungsten.”

This teaches against the currently claimed method of polishing tungsten with a slurry at a pH from about 6 to about 9, as currently claimed in claim 9.

Scherber does not remedy the deficiencies of Streinz, as no pH values are disclosed in the instantly claimed pH ranges. While in most areas, the teachings of Scherber are similar to those of Streinz, Scherber is silent as to pH and certainly does

nothing to suggest that pH values higher than 5.0 for tungsten polishing compositions would be acceptable (e.g., would not corrode tungsten).

In addition, both Streinz and Scherber teach a vast selection of oxidizing agents, fluoride containing additives (Streinz), pH adjusting compounds, and even organic acids. Applicant respectfully submits that the instantly claimed tungsten polishing compositions comprising periodic acid such as recited in independent claim 9, or at least the polishing compositions comprising the specific combination of periodic acid and the elected second oxidizer malonic acid such as recited in independent claim 10, are sufficiently specific combinations of elements that elements picked and chosen from prior art references containing such a large number of potential combinations as in Streinz and Scherber are insufficient to effectively disclose all the elements of such instantly claimed combinations. *See In re Ruschig*, 379 F.2d 990, 993-994 (CCPA 1967) (distinguishing *In re Petering*, 301 F.2d 676, 133 USPQ 275 (CCPA 1962) and holding that the disclosure of a genus comprising over 1,000 compounds does not adequately describe a species within the genus); *see also Pfizer, Inc. v. Novopharm Ltd.*, 2002 U.S. Dist. LEXIS 2588 at 7-8 (N. D. Ill. 2002) (citing *In re Ruschig* and distinguishing *In re Petering*, and holding that thousands of species are too many species within the formulated genus to sufficiently describe a species thereunder); *see also Schering Corp. v. Precision-Cosmet Co., Inc.*, 614 F. Supp. 1368, 1373-1374 (D. Del. 1985) (following the holdings of *In re Petering* and *In re Schaumann*, 572 F.2d 312, 313-314 (CCPA 1978), and finding that a disclosed element having “in excess of one hundred” variations is insufficient to adequately describe a small set of species).

Thus, for either of the foregoing reasons, Applicant respectfully submits that claims 9-12, 14-16, 58-60, and 62-63, as amended, are patentable over Streinz, Scherber, or the combination thereof. As a result, Applicant respectfully requests that the obviousness rejection of claims 9-12, 14-16, 58-60, and 62-63 be reconsidered and withdrawn.

Claims 9-12, 14-16, and 58-63 were rejected under 35 U.S.C. § 103(a) as being obvious over the combination of Streinz and Scherber, in further view of U.S. Patent No. 5,700,389 to Nakagawa (“Nakagawa”) on pages 4-5 of the Office Action. The Office Action indicates that Nakagawa discloses the addition of imidazole to the composition.

Thus, the Office Action asserts that the combination of Nakagawa with Streinz and Scherber renders obvious claim 61. Applicant respectfully traverses this rejection for the following reasons.

First, there is no motivation to combine Nakagawa with Streinz and/or Scherber. Nakagawa teaches a solution for “preventing rusting of the copper or copper alloy surface and for roughening the surface” (see Nakagawa, column 1, lines 6-9). CMP is the exact opposite of roughening. The goal of CMP is to make a smooth, flat surface. See Streinz, column 2, lines 3-6. No one of ordinary skill in the art would be motivated to incorporate a roughening agent for copper into a chemical mechanical polishing slurry used for tungsten.

While Nakagawa may teach addition of imidazole to an oxidizing composition (see Nakagawa at column 2, lines 11-16), it also discloses compositions for etching copper or copper alloys (see *id.* at Abstract and column 1, lines 6-10), not tungsten substrates as recited in the instant claims. Further, Nakagawa teaches away from the periodic acid oxidizer instantly claimed and teaches a preference for a persulfate oxidizer. See *Id.* at column 1, line 46. Likewise, Nakagawa teaches away from the elected malonic acid component recited in independent claim 10 and teaches a preference for an inorganic acid and/or a component of amidosulfuric acid or an aliphatic sulfonic acid. See *Id.* at column 1, lines 45-54. For any of the foregoing reasons, one of ordinary skill in the art would not have been motivated to combine Nakagawa with Streinz, Scherber, or both, nor would there have been a reasonable expectation of success in picking and choosing elements from Nakagawa in combination with those from Streinz and/or Scherber to attain the instantly claimed invention.

In any event, even if one of ordinary skill would be motivated to combine this art, Nakagawa does not remedy the deficiencies of Streinz and Scherber, since it does not teach a pH value of its composition from 6 to 9. Indeed, Nakagawa is silent as to compositional pH.

Thus, for at least the foregoing reasons, Applicant respectfully submits that claims 9-12, 14-16, and 58-63, as amended, are distinguishable from Nakagawa, Streinz, Scherber, or any combination thereof. As a result, Applicant respectfully requests that

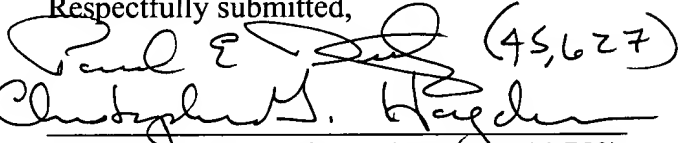
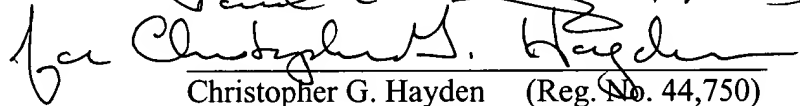
the obviousness rejection of claims 9-12, 14-16, and 58-63 be reconsidered and withdrawn.

### Conclusions

Applicant respectfully submits that the application is now in condition for allowance, early notice of which would be appreciated. Should the Examiner disagree, Applicant respectfully requests that the undersigned be contacted to resolve any remaining issues forestalling allowance of the claims.

No fee is believed to be due for this submission, as the 27 total pending claims less than the 42 claims for which Applicant has previously paid. Should any fees be due, however, please charge the required fees to Morgan Lewis & Bockius LLP Deposit Account No. 50-3010.

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Respectfully submitted,  
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